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Tularemia in Western Washington, August 2005

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From May 28, 2005 - August 16, 2005, seven cases of tularemia were reported in residents of western Washington State. In recent years, two to four tularemia cases were reported annually (range 1-8) in Washington State; between January 1, 1990 and August 15, 2005, a total of 52 human cases of tularemia were reported (see graph, page 3).

The recent tularemia cases reside in Cowlitz County (2), Clark County (2), Thurston County (2) and King County (1). Onset dates for the case patients are from May 28th to August 2nd. The age range is 6-66 years of age; five case patients are male, two are children. Case investigations suggest that most of the exposures occurred in the county of residence, though for two cases there is a possibility of exposure both locally and out of state, and the King County case was exposed to the infection while camping in Whatcom County.

Four of the cases presented with ulceroglandular or glandular tularemia, one with meningitis and pneumonia, and two with pneumonic tularemia (see Clinical information below). Both of the pneumonic tularemia cases were probably exposed after inhaling bacteria while using power tools to do landscaping (mowing, weed trimming) and inadvertently aerosolizing bacteria from an animal carcass. Other exposures for recent cases involved insect bites (deer flies); investigation is ongoing for two cases.

Tularemia is caused by the bacteria *Francisella tularensis* and exposure to just a few bacteria can cause febrile disease in a large variety of animals and in people. Due to the low infectious dose, laboratory workers handling tularemia cultures have a potential for exposure.

The disease cycles in nature causing periodic die-offs of rabbits, squirrels, voles, beaver, muskrat and other small mammals. Infected wildlife may be obviously ill (depressed, anorexic, ataxic, inactive, have a roughened coat, have eye drainage, etc.) or may be found dead. Tularemia is transmitted from animal to animal (and to humans) by deer flies and ticks. Animal bites (i.e. a squirrel bite while pulling it from a pet cat's mouth) and skinning or handling infected animals are common exposures. Less commonly, eating undercooked wild animal meat, and handling infected pelts could be a sources of exposure.

Veterinarians should be aware that pets may be infected with tularemia and the animals can then transmit the infection to people. Sick and dead rabbits and rodents are easily caught and eaten by outdoor pets; ticks and deer flies also transmit the infection. A recent serosurvey of outdoor pet dogs and cats in 18 counties throughout Washington showed that 7/370 (1.9%) had been exposed to tularemia. Of those tested in Clark, Cowlitz and Lewis counties, 3/69 (4.3%) had serological evidence of exposure.

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Tularemia is also a potential agent of bioterrorism. Sporadic cases are investigated to ascertain the likely exposure; cases of tularemia without likely outdoor or pet exposures should be reported immediately.

Clinical Information

The incubation period is usually 3-5 days with a range of 1-14 days. Identifying the primary clinical manifestation in tularemia infection helps to indicate the route of exposure. Tularemia causes fever, chills, muscle aches, headache and nausea along with one of the following clinical syndromes.

- **Ulceroglandular** tularemia is the most common form and presents as an indolent skin ulcer at the site of inoculation along with regional lymphadenopathy. Less commonly, the **Glandular** form presents as a painful enlarged lymph nodes that may become suppurative without a skin lesion. In these cases, exposure is usually an inoculum at the site of the skin lesion (animal bite, deer fly or tick bite, cut or abrasion while skinning an animal, etc.)

- **Pneumonic** tularemia occurs as pleuritis or pneumonia and usually results from inhalation of airborne particles that are stirred up in dust. This form can also be secondary to bacteremia. Common exposures may occur during landscaping with tools or machinery (mowing, weed eating) or while stirring up dust in barns with rodent infestation. This is also the form that would manifest if a population were exposed to the weaponized form of the bacteria in an intentional biological release.

- **Oropharyngeal** tularemia presents as exhudative pharyngitis, abdominal pain and diarrhea. This form is often associated with eating improperly cooked rabbit or rodent meat, or drinking contaminated surface water.

- The **Oculoglandular** form occurs when tularemia is introduced into conjunctiva. It results in purulent conjunctivitis with regional lymphadenitis. This form is less common, though it has occurred in Washington after eye contamination with stream water.

- **Sepsis** or **Typhoidal** tularemia is a fulminating acute systemic illness often without a skin lesion or lymphadenopathy. This may occur in patients with underlying illness.

The febrile illness often relapses and a secondary syndrome can develop if the initial antimicrobial therapy was empiric and not appropriate for *F. tularensis*.

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Laboratory testing

Confirmatory diagnosis of tularemia must be done in a public health or lab response network Level A laboratory. Rapid tests of wound material, pleural fluid, blood, lymph node aspirates, exudates, and throat swabs include direct fluorescent antibody (DFA), time resolved fluorescence (TRF), and polymerase chain reaction (PCR). Cultures should also be done and confirmed at the Department of Health Public Health Laboratories. If tissue is not available, serologic diagnosis using microagglutination testing sent to the Centers for Disease Control and Prevention is done by identifying a four fold rise in titer between specimens taken 2-4 weeks apart.

Management

Streptomycin and gentamicin are the first drugs of choice. Doxycycline and chloramphenicol are used in less severe illness but since they are bacteriostatic, dosage schedules longer than 10 days may be needed to prevent relapse. Penicillins and cephalosporins are not effective and should not be used to treat tularemia. Post exposure prophylactic antimicrobial treatment of asymptomatic close contacts is not warranted, however may be considered for exposed laboratory personnel in some circumstances.

Reporting

Health care providers, hospitals, laboratories and veterinarians should report suspected or confirmed tularemia infection to the appropriate local health jurisdiction (http://www.doh.wa.gov/LHJMap/LHJMap.htm).

Reported Tularemia Cases,
January 1, 1990 to August 17, 2005
N = 52